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Agriculture.

Fifty-first annual report, 1937-1938, Vermont agricultural experiment station. Burlington, Vt., 1938. 35p. University of Vermont. Agricultural experiment station. Bulletin no.438.

What's new in farm science. Part one. Annual report of the director Agricultural experiment station, University of Wisconsin. Madison, Wis., 1939. 96p. University of Wisconsin. Agricultural experiment station. Bulletin no.446.

Air Conditioning.

Application of storage refrigeration to air conditioning. By C. F. Boester. Heating, piping and air conditioning. v.11,no.11. November, 1939. p.710-712. "Bibliography":p.712.

Exhaust fan on window cools entire house. Popular mechanics. v.72,no.6. December, 1939. p.890. Fan is mounted outside window, by supporting it on outside structure or wall bracket. Canvas duct connects fan with window. When windows are opened and fan turned on, enough air is drawn out of house to make complete change in every room per minute. Breeze created on lawn has enough force to keep away mosquitoes and other flying pests.

Introduction and diffusion of conditioned air in rooms. By D. W. Nelson. Urbana, Ill., 1939. p.37-57. University of Illinois. Engineering experiment station. Circular no.37.

Psychrometric chart: its application and theory. Part 5. By William Goodman. Heating, piping and air conditioning. v.11,no.10. October, 1939. p.613-615,617.

Psychrometric chart: its application and theory. By William Goodman. Heating, piping and air conditioning. v.11,no.11. November, 1939. p.671-674. Part 6.

Psychrometric chart: application and theory. By William Goodman. Heating, piping and air conditioning. v.11,no.12. December, 1939. p.749-752.

Arches.

Glued laminated wooden arch. By T. R. C. Wilson. Washington, U.S. Govt.print.off., 1939. 122p. "Literature cited": p.121-122. U.S. Department of agriculture. Technical bulletin no.691.

Brooders, Electric.

Electric brooder can be built for \$10. In What's new in farm science. Madison, Wis., 1939. p.6-7. University of Wisconsin. Agricultural experiment station. Bulletin no.446.

Electric brooding at low energy cost. By R. J. Bugbee. Electrical world. v.112,no.21. November 18, 1939. p.1480. Table gives cost of electric brooding in Vermont.

Building Materials.

Condensed review of some recently developed materials. Machinery. v.46,no.3. November, 1939. p.196-201. Arranged alphabetically by trade names.

Design and construction: analyses of asphaltic types. Papers presented at the Twelfth national asphalt conference at Los Angeles, Calif., March 1, 1939. New York, 1939. 54p. Processed. Asphalt institute. Construction series no.49.

Equipment: development for bituminous construction. Papers presented at the Twelfth National asphalt conference at Los Angeles, Calif., March 2, 1939. New York, 1939. 71p. Processed. Asphalt institute. Construction series no.50.

Materials: review, analysis and forecast. Papers presented at the Twelfth National asphalt conference at Los Angeles, Calif., February 28, 1939. New York, 1939. 59p. Processed. Asphalt institute. Research series no.5.

Opportunities for rock wool manufacture in Georgia. By A. S. Furcron, A. C. Munyan and R. W. Smith. Atlanta, Ga., 1939. 18p. Mimeographed. Georgia. Department of natural resources. Division of mines, mining and geology. Information circular no.10.

Corrosion.

Corrosion in steam heating systems: dissolved gases--the basic causes for corrosion. Part 1. By L. F. Collins and E. L. Henderson. Heating, piping and air conditioning. v.11,no.10. October, 1939. p.620-622. Comprehensive treatment of subject of corrosion in steam heating systems is based upon about 15 years of research work for the Detroit Edison co. and is believed to be the most authoritative treatise on subject that has ever been prepared.

Corrosion in steam heating systems: dissolved gases--the basic causes for corrosion. Part 2. By L. F. Collins and E. L. Henderson. Heating, piping and air conditioning. v.11,no.11. November, 1939. p.675-677. Effects of system design and operation.

Corrosion in steam heating systems. Part 3. By L. F. Collins and E. L. Henderson. Heating, piping and air conditioning. v.11, no.12. December, 1939. p.735-738. Methods of reducing

Corrosion. (Cont'd).

corrosion troubles in steam heating systems are discussed, including freeing of plugged pipes with chemical solvent, vacuum cleaning radiators, use of corrosion inhibitors, and possible changes in heating system construction.

Cotton and Cotton Ginning.

Cotton production and distribution, season of 1938-39. Washington,
U.S. Govt.print.off., 1939. 52p. Processed. U.S. Bureau
of the census. Bulletin no.176.

Dixie dilemma. By A. W. Baum. Country gentleman. v.109,no.12.
December, 1939. p.7-8,60. Discussion of the cotton situa-
tion.

Dams.

Building Bartlett Dam. By E. C. Koppen. Reclamation era.
v.29,no.11. November, 1939. p.308-314.

Water-power dam in Sweden formed of concrete monoliths. Engineering
news record. v.123,no.21. November 23, 1939. p.63-64.
Use of T-shaped monoliths for a dam exposed to low temperatures
shows economies in cost and is expected to reduce deterioration and
maintenance troubles. Steel and concrete used in temporary dam.

Drainage.

Storm-drainage structures on the All-American canal. By G. W. Manly.
Reclamation era. v.29,no.11. November, 1939. p.302-305.
Plan evolved for providing for storm drainage was briefly as follows:
1. So far as practicable, concentrate flow of washes by constructing
dikes and channels to divert smaller into larger washes. 2. For 10
major washes, provide siphons for carrying flow of canal under washes,
or overchutes for carrying flow of washes over canal. 3. For remain-
ing 17 minor washes, provide drainage inlet structures for carrying
flow of washes into canal.

Electricity - Distribution.

Electric light and power industry in 1939. By C. W. Kellogg. New
York, Edison electric institute, 1940. 7p. Mimeographed.

Electricity on the Farm.

Electric equipment for the bactericidal treatment of dairy utensils.
By E. T. Swink. Blacksburg, Va., 1939. 15p. "Selected
bibliography": p.15. Virginia agricultural and mechanical college
and polytechnic institute. Bulletin no.147.

Erosion.

Erosion losses from a 3-day California storm. By J. G. Barnesberger.
Washington, U.S. Govt. print. off., 1939. 15p. U.S. Department
of agriculture. Soil conservation service.

Farm Machinery - Housing.

Permanent shops and machine sheds; adequate shelter needed for farm
machinery. Markets: Building section. August 10, 1939. p.5.

Farm Machinery and Equipment.

Farm equipment and economic welfare. By J. M. Tucker. Implement
and tractor. v.54, no.24. November 25, 1939. p.16-18,
29-30. In 1850 American farmers had approximately 4-1/2 per
cent of their total capital invested in farm machinery. In 1937
farmer still had same percentage of total capital invested in farm
machinery, even though investment in machinery had risen to over
three billion. Machinery, itself, by enabling farmer to grow more
produce with less labor, had created much more wealth per farmer;
had enabled him to build good buildings, fence his farm, equip his
home with many comforts, buy autos and trucks, radios and furnaces.

Grain usually needs to be windrowed before combining in Wisconsin.
In Annual report of the Director, Agricultural experiment station,
University of Wisconsin. Bulletin no.446. Madison, Wis., 1939.
p.3-5.

Harvester cuts and threshes in one operation. Popular mechanics.
v.72, no.6. December, 1939. p.838. Operated from power
takeoff of one plow size tractor, new all-crop harvester cuts and
threshes at same time, combining work of binding, shocking and
threshing into one-man job. Ample large for the average farm, stream-
line machine features forty-inch cut, wide bar cylinder, and rubber
shelling contacts with simple adjustments for more than 100 grains,
peas and seeds. With it farmers can harvest valuable seed, like soy-
beans, clover, alfalfa, vetch and grasses of every kind, thus encour-
aging growth of legumes and grasses that help build soil fertility,
soak up rainfall and stop erosion.

Mechanization of sugar beet production. By E. M. Mervine and S. W.
McBirney. Implement record. v.36, no.9. September, 1939.
p.11-12, 34.

20 years of farm machinery development. By H. G. Davis. Nation's
agriculture. v.14, no.11. December, 1939. p.7, 16.

Two more new Farmalls with hydraulic implement control. Implement
record. v.36, no.9. September, 1939. p.15-16.

Tulip harvester and crew dig 20,000 bulbs per hour. Popular mechanics.
v.72, no.6. December, 1939. p.865. Operated by crew of
seventeen men, including tractor driver, tulip harvester handles 20,000

Farm Machinery and Equipment. (Cont'd).

bulbs, or about eighty full boxes, in hour. Standing along sides of twenty-three foot machine, men sort valuable bulbs as they are carried toward rear by endless belts. It rides on four sets of wheels, and front section is articulated for convenience in steering at ends of rows.

Farm Structures.

Creep-feeding of spring lambs. By R. F. Miller. Berkeley, Calif., 1939. 10p. University of California. Agricultural experiment station. Circular no.348.

Fertilizer Placement.

Fertilizer and liming practices recommended for South Carolina. By H. P. Cooper. Clemson, S.C., 1939. 23p. Clemson agricultural college. Agricultural experiment station. Circular no.60.

Fertilizer is forced into the earth with compressed air. Popular mechanics. v.72,no.6. December, 1939. p.825. After earth has been drilled, fertilizer is forced beneath surface with aid of air-pressure machines, thus enabling workers to nourish roots deep in ground.

Fertilizing the subsoil. Farm implement news. v.60,no.22. November 2, 1939. p.33.

Fertilizers.

Commercial fertilizers. By L. S. Walker, E. F. Boyce and L. E. Davis. Burlington, Vt., 1938. 27p. University of Vermont. Agricultural experiment station. Bulletin no.440.

Fire Protection.

Fireproofing Christmas trees. By Martin Leatherman. Washington, U.S. Govt.print.off., 1939. 5p. U.S. Department of agriculture. Leaflet no.193.

Il faut aux villages les moyens de lutter contre le feu! By J. Engelhard. Génie rural. v.32. July/August, 1939. p.11-13. The need for means of fighting fire in the villages.

Floods and Flood Control.

Storms cause floods below Boulder dam. By L. J. Foster. Engineering news-record. v.123,no.23. December 7, 1939. p.71-72.

Flow Meters.

Piping and measurement engineers must work together for flow meter accuracy. By L. K. Spink. Heating, piping and air conditioning. v.11,no.11. November, 1939. p.683-686. Importance of

Flow Meters. (Cont'd).

relationship between piping design and layout and flow metering is not as generally appreciated as is necessary for accurate metering. Accuracy of meters depends very definitely upon how and where they are installed. It is author's purpose here to point out things piping designers must consider, and factors that influence meter accuracy.

Flow of Air.

Use of air-velocity meters. By G. L. Tuve, D. K. Wright, Jr., and L. J. Seigel. Heating, piping and air conditioning. v.11,no.11. November, 1939. p.703-709. Comparison is made of several methods of instrument calibration, and calibration curves for typical instruments are shown. Use of various instruments is also reported, applying to supply openings, air intakes and free air streams. For free air streams analysis is based on law of conservation of energy.

Flow of Heat.

Essentials of heat transfer by natural convection. By G. A. Hawkins. Industrial power. v.37,no.6. December, 1939. p.55-58,86,88. Practical examples show how to use simple equations and curves for figuring heat loss by natural convection from bare or insulated pipes.

Foods, Frozen.

Let's face the facts on frozen foods. By C. Q. Sherman. Ice cream trade journal. v.35,no.8. August, 1939. p.8-9. Gives frozen food table of equivalents.

Forage Crops.

Digestibility of alfalfa, timothy, and soybeans as silages and as hays. By J. A. Newlander and others. Burlington, Vt., 1938. 24p. University of Vermont. Agricultural experiment station. Bulletin no.430.

Fuels.

Effect of oxidation of anthracite on its heating value. By G. S. Scott, G. W. Jones, and H. M. Cooper. Industrial and engineering chemistry. Industrial edition. v.31,no.8. August, 1939. p.1025-1027. "Literature cited": p.1027. Relation of heating value, volatile matter, and ash content for 1008 samples of anthracite is presented graphically. Tests show that, when anthracite is oxidized with air at elevated temperatures its volatile matter content, oxygen content, and B.t.u. value, as determined by standard methods of coal analysis, change in manner that indicates direct relation at various oxidation temperatures used, and that relation holds, irrespective of quality of coal tested. Tests also show that actual heating values of oxidized samples, as determined by standard methods of analysis, deviate from heating values of average unoxidized anthracite and that deviation

Fuels. (Cont'd).

increases with increase in amount of oxidation of samples. Relations given may be of value in determining whether different anthracites have oxidized as result of spontaneous heating, and in determining amount of weathering undergone by finer sized anthracite during long storage periods.

"Liquid coal" claimed to be more economical than gas. Science news letter. v.35,no.25. June 24, 1939. p.391.
Specially prepared coal ground to 300 mesh was suspended in gasoline or oil to run motor after start.

Heating.

Agriculture has engineering problems in heating and ventilating. By F. B. Lanham. Heating, piping and air conditioning. v.11,no.12. December, 1939, p.769-774. Bibliography: p.774. Purpose of paper is to review few problems in agriculture which involve heating and ventilating practices and indicate how influence of heating, ventilating and air conditioning engineers can improve comfort and efficiency on farm. Usual work in these fields entails installations in factories, offices, public buildings and often in urban developments of rather mammoth proportions. On other hand agricultural engineer finds that great number of his problems involve principles of heating, ventilating and air conditioning of specialized nature.

Automatic mechanical draft oil burners designed for domestic installations. Washington, U.S. Govt.print.off., 1939. 23p.
U.S. National bureau of standards. Commercial standard CS75-39.

Humidity.

Desiccation of frozen foods. By W. J. Finnegan. Refrigerating engineering. v.38,no.4. October, 1939. p.223-224.
What causes it -- How to avoid it -- About cold rooms.

Humidity Control.

Permissible relative humidities in humidified buildings. By P. D. Close. Heating, piping and air conditioning. v.11,no.12. December, 1939. p.766-768. Paper deals with condensation on interior wall, glass and ceiling surfaces with particular reference to maximum humidities that can be maintained to preclude condensation.

Insulation.

Heat insulation facts and figures. American builder. v.61,no.12. December, 1939. p.64-66.

Insulation board, an improved material for home building. American builder. v.61,no.12. December, 1939. p.44-45.
Gives cross-section of building showing typical uses of insulation board.

Irrigation.

Irrigation improvements in Washington. New agriculture.
v.22,no.2. November, 1939. p.7.

Small irrigation system operates on one third gallon of fuel per hour.
In What's new in farm science. Madison, Wis., 1939. p.6.
University of Wisconsin. Agricultural experiment station. Bulletin
no.446.

Koroseal.

Recent developments with Koroseal. By F. K. Schoenfeld, A. W. Browne, Jr.,
and S. L. Brous. Industrial and engineering chemistry. Industrial
edition. v.31,no.8. August, 1939. p.964-968.
"Literature cited": p.968. "Koroseal" plastics exhibit wide
range of physical, chemical, and electrical properties which can be
modified by use of suitable plasticizers, loading pigments, and
special compounding ingredients. Essentially rubberlike "Koroseal"
stocks may be milled, calendered, extruded and molded without vulcani-
zation into a variety of enduring products. "Koroseal" is especially
valuable for uses requiring resistance to water, acids, alkalies,
oxidizing agents, and corrosive chemicals.

Lighting.

Lighting the home with electricity. By E. M. Cobb. Orono, Maine,
1939. 16p. University of Maine. Agricultural extension ser-
vice. Bulletin no.268.

Lubrication.

Diesel engine lubrication: misapplication of extreme pressure lubricants.
By C. J. Capley. Southern power and industry. v.57,no.12.
December, 1939. p.57-61. Intelligent choice of lubricants
involves not only knowledge of their special merits but an equal
understanding of sacrifice in other qualities.

Lubrication problems created by the modern Diesel. Lubrication.
v.25,no.10. October, 1939. p.109-120.

Marketing.

Oregon's problem in marketing agricultural and industrial products.
By W. J. Kerr. Portland, Oreg., Oregon state board of higher
education, 1938. 76p.

Miscellaneous.

Department of Agriculture appropriation act, 1940. Experiment station
record. v.81,no.6. December, 1939. p.753-756.

Federal aid to higher education; the Land grant colleges and universities.
By F. B. Mumford. Address delivered at the Annual meeting of Asso-
ciation of American universities, Columbia, Mo., October 31, 1939.
8p. Mimeographed.

Miscellaneous. (Cont'd).

United States government manual, October 1939. Washington, U.S.
Govt.print.off., 1939. 551p. (U.S. Information service,
Office of government reports. 1405 G St. N.W. Wash., D.C.)

Motor Fuel.

Low quality of distillate fuels hinder use in farm tractors. By
E. L. Barger. National petroleum news. v.31,no.46.
November 15, 1939. p.482,484,485. About nine-tenths of
all farm tractors are capable of handling fuels heavier than gasoline,
yet the major part of tractor fuel consumed is gasoline. Distillate
or heavy fuels would be used to greater extent if variable and fre-
quent poor quality of these fuels could be eliminated by adoption of
standard specification. Flowing and laboratory tests show 30-octane
distillate of good quality has cost advantage over 70-octane gasoline
although latter has advantage in load performance.

Octane ratings and inspection data for motor fuels. National petro-
leum news. v.31,no.49. December 6, 1939. p.23-24,26,28,
30-33.

Motors, Electric.

Selecting the motor for feed grinding. By C. P. Wagner. Markets:
Building Section. November 23, 1939. p.5. Determining
maximum-sized motor is very important.

Paints and Painting.

Paint resistant to decay has a charcoal base. Popular mechanics.
v.72,no.6. December, 1939. p.856. With formula recently
developed it is possible to char many building materials, including
metals, concrete, brick, plaster, roofing, canvas, paper and all
types of wood. Base of product, which has about same consistency
and covering qualities as paint, is charcoal obtained by burning hard-
wood to 800 degrees Fahrenheit. It is black and can be applied easily
with brush or sprayer, and when applied it forms a hard permanently
bonded, non-porous, flat black coating of carbon resistant to moisture,
fungi, salt, termites and acids.

Selecting and applying paints. By C. H. Van Vlack. Blacksburg, Va.,
1939. 46p. Virginia agricultural extension service. Bulletin
no.146.

Pipes and Piping.

Charts simplify pipe size selection for industrial water piping systems.
By E. A. Windham. Heating, piping and air conditioning.
v.11,no.12. December, 1939. p.747-748. Outlines some
of problems involved in designing industrial water piping systems.

Pipes and Piping. (Cont'd).

High pressure pipe welding joints: a review and a new development.

By H. N. Boetcher. Heating, piping and air conditioning.

v.11,no.11. November, 1939. p.678-679. With improved equipment and technique, and rigid qualification tests, joint design for welded power piping installations has assumed increasing importance. Discussion of designs involving separate backing rings, and development of new design being used for high and intermediate pressure piping for Westport station extension, is given.

Power Farming.

Changes in technology and labor requirements in crop production. Vegetables.

By J. C. Schilletter, R. B. Elwood and H. E. Knowlton.

Phila., Penna., 1939. 131p. Processed. Works projects administration, National research project. Report no.A-12.

Power Projects.

Look at "Little TVA". By L. W. W. Morrow. Electrical world.

v.112,no.23. December 7, 1939. p.67-69,133-134.

Nebraska power districts reach completion stage. Variable water flow make power possibilities unknown. Limited market and high costs handicaps. Many influences at work make outlook dubious.

Refrigeration.

Food preservation in the South. By C. T. Baker. Heating, piping and air conditioning.

v.11,no.12. December, 1939. p.775-777.

Purpose of paper is to outline methods employed in preserving food commodities in South and to indicate possibilities for further development in this field by application of modern refrigeration to food conservation.

Refrigerators.

"Coldest" refrigerator to run at 450 degrees below zero. Popular mechanics.

v.72,no.6. December, 1939. p.876-877.

It would run on compressed helium, which when liquefied produces coldest cold known to man, only few degrees above absolute zero. At 450 degrees below zero all lubricants are frozen solid, so this difficulty was met by doing away with lubricants in helium engine and replacing the conventional engine piston with flexible diaphragm of stainless steel. Diaphragm is sealed at its edges by copper gasket between two steel plates, and expansion of helium occurs between diaphragm and one of plates. Two or three such engines will be used in consecutive stages in refrigeration, since it is impractical to try to reach extreme low temperatures in one step down temperature scale.

Research.

Regional research laboratories and some of their research projects.
Remarks of Dr. Henry G. Knight...before the Power machinery department
of the Farm equipment institute, Chicago, Ill., December 7, 1939.
[Washington, U.S. Bureau of agricultural chemistry and engineering,
1939] 16p. Mimeographed.

Report for 1938. Rothamsted experimental station, Harpenden.
Gibbs & Bamforth, Ltd., St. Albans, England, 1939. 212p.

Treasure hunting up-to-date. By L. A. Hawkins. Popular mechanics
magazine. v.72,no.6. December, 1939. p.801-803,150A,152A,
153A,155A. Discussion of the advances made by research.

Wider recognition of agricultural research. By F. B. Mumford.
Address delivered to agricultural experiment directors at the Annual
meeting of the Association of land grant colleges and universities,
Washington, D.C., November 15, 1939. 16p. Mimeographed.

Resources.

National resources planning facts. National resources committee.
Washington, U.S. Govt.print.off., 1939. 11p.

Rope.

Properties of wire rope vary with the steel used. By R. B. Williams.
Industrial power. v.37,no.6. December, 1939. p.73,88.
Strength ranges from 42 tons for 1-inch rope made of improved plow
steel to 13.7 tons for ordinary iron. Heat necessary for preforming
has no effect on established physical characteristics.

Rubber.

Nomenclature of synthetic rubbers. By H. L. Fisher. Industrial and
engineering chemistry. Industrial edition. v.31,no.8.
August, 1939. p.941-945. "Literature cited": p.945.
Brief history of synthetic rubbers and of synthetic rubberlike sub-
stances is given, together with outline of reasons for continued use
of term "synthetic rubber", especially for rubberlike polymers of
butadiene and its derivatives, including chloroprene. Recent and
new class terms for rubber like substances are given and their uses
discussed. New term "elastomers" is suggested to cover all rubber-
like substances, "elastoprenes" for diene polymers, "elastolenes"
for polyisobutylenes, and "elastothiomers" for polyethylene sulfides
(Thiokol). It is also suggested that Stevens' term "elastoplastics"
be used for growing class of rubberlike plastics such as plasticized
vinyl chloride (Koroseal), certain polyacrylic esters, etc. "Plastomer"
is used for true and thermosetting thermoplastics. Classification of
all rubberlike substances is tabulated.

Silos.

Effect of weight of tampers and number of tamps on the flexural strength of concrete silo staves. By C. A. Hughes, D. G. Miller and P. W. Manson. Minneapolis, Minn., 1939. University of Minnesota. Institute of technology. Engineering experiment station. Technical papers, no.10. (Reprint from Journal of the American concrete institute. v.36. September, 1939. p.37-47.)

Soils.

Device for measuring volume of soil samples. By S. R. King. Engineering news-record: v.123,no.23. December 23, 1939. p.749. Enables volume of an irregular cavity such as sampling pit to be readily obtained by addition of two gage readings, one denoting volume displaced by apparatus and other denoting volume of irregular remainder of cavity by measuring liquid necessary to fill it.

Method and procedure of soil analysis used in the division of soil chemistry and physics. By W. O. Robinson. Washington, U.S. Govt. print.off., 1939. 21p. "Literature cited": p.21. U.S. Department of agriculture. Circular no.139.

Soybeans.

Soybeans: culture and varieties. By W. J. Morse and J. L. Cartter. Washington, U.S. Govt.print.off., 1939. 39p. U.S. Department of agriculture. Farmers' bulletin no.1520.

Storage of Farm Produce.

Wheat stored under lake for wartime needs. Popular mechanics. v.72,no.6. December, 1939. p.816. As precaution against possibility that war blockade may interfere with imports of food, Switzerland is storing wheat at bottom of her deep mountain lakes. Grain, forced into tank of 500,000 pounds capacity is expected to remain unspoiled under water for years.

Sweet Potatoes.

Sweet potatoes challenge corn. By J. S. Cates. Country gentleman. v.109,no.9. September, 1939. p.23,63. Discussion of the sweet-potato starch work at Laurel, Miss.

Thermostats.

Study of certain factors that affect droop characteristics of thermostats. By B. E. Shaw and L. Ivon. Heating, piping and air conditioning. v.11,no.12. December, 1939. p.761-765. Purpose of paper is to study some of factors affecting droop characteristics of thermostats. Droop may be defined as peculiarity of thermostat to control temperature adjacent to its location at point below setting (dial adjustment) under certain conditions. Droop may be affected by artificial heat developed within thermostat, wall-temperature condi-

Thermostats. (Cont'd).

tions, thermostat mass, air drift through thermostat, heat-gain rate of system, heat loss-rate system, and many other factors. Authors confine comments to study of droop conditions occasioned by using artificial heat within thermostat, effect of cold wall conditions, and effect of variations in rate of indoor temperature changes.

Tobacco.

Applying air conditioning to curing and drying of tobacco. By A. H. Cooper. Refrigerating engineering. v.38,no.4. October, 1939. p.207-209. Scientific study of curing bright tobacco indicates that curing process is accurately defined within narrow limits, and that control, rather than art, may be more definitely relied upon. Tobacco curing differs from true drying problem in that both chemical and physical changes are involved. Physical factors were investigated for they control both physical and chemical changes which take place during curing and drying. From results obtained air conditioning improves, process by (1) reducing time approximately one-half, doubling capacity of barns; (2) production of uniform quality tobacco, completely eliminating loss from improper curing; (3) considerable reduction in labor and fuel requirements.

Laboratory for use in determining the influence of various temperatures and relative humidities on final quality of air-cured tobacco. By L. S. O'Bannon. Heating, piping and air conditioning. v.11; no.11. November, 1939. p.699-702. Kentucky agricultural experiment station recently completed air conditioned laboratory for research in curing of tobacco. Laboratory consists of nine chambers, in which tobacco is housed during process of curing, together with necessary equipment for maintaining within each chamber any desired temperature and relative humidity. Laboratory was designed for experiments with air-cured tobacco, and chief objective was determination of conditions required for obtaining cured tobacco of best quality.

Tractors.

Farm-fitting tractors. By J. E. Stanford. Southern agriculturist. v.69,no.10. October, 1939. p.6-7.

1940 tractor review. Market growers journal. v.65,no.11. December 1, 1939. p.479-481,484-485. Revolutionary improvements in new row crop models enlarge usefulness of tractor. Industry keeps pace with automobiles. Hydraulic lift, quick change of attachments, speed control, streamlining, lower cost, comfort for the driver. All move on rubber.

Ventilation.

Load value data on barn ventilation. By H. N. Stapleton. Electrical world. v.112,no.19. November 4, 1939. p.78,79. This is most important in wind-tight structure. To supply heat under usual conditions, only housed animals are available, and while each

Ventilation. (Cont'd).

cow is equivalent to about 12.5 sq. ft. of cast-iron radiation, steam pressure cannot be pushed up in zero weather. Each cow breathes and perspires about 11 lb. of water daily, or 24 cows to 1 barrel. Air movement without drafts is essential. Gravity ventilating system will do passable job on well insulated stable, but is seriously affected by changes in wind direction or velocity. Same description applies to electric fan equipped with on and off thermostat control. With fan running continuously during winter, its cost of installation plus ten to fifteen years of operation will approach initial cost of gravity system. With fan sized at 60 c.f.m. per cow, demand will run from 3.5 to 6 watts per cow depending on fan performance. Usual fan with stable of 25 to 50 cows with demand of from 125 to 170 watts running continuously from October to May will show energy use comparable to electric range--90 to 140 kw. hr. per month. From farmer's viewpoint this is low-cost application when \$1.50 to \$2.50 per cow installs it and 9 to 12 cents per cow per month operates it.

This class of service can be sold on strength of improvement in health of animals, improved milk production, removal of stable odors, more comfortable working conditions in stable and insurance against damage to building from condensation and subsequent decay. Adequate ventilation can be provided electrically at less cost and with less attention than by any other method.

Walls.

Structural properties of "Bender steel home" wall construction sponsored by the Bender body company. By H. L. Whittemore, A. H. Stang, and V. H. Phelan. Washington, U.S. Govt.print.off., 1939. 14p. National bureau of standards. Building materials and structures. Report BMS27.

Structural properties of conventional wood-frame constructions for walls, partitions, floors, and roofs. By G. E. Heck. Washington, U.S. Govt.print.off., 1939. 23p. "Selected references": p.23. U.S. National bureau of standards. Building materials and structures. Report BMS25.

Structural properties of two brick-concrete-block wall constructions and a concrete-block wall construction sponsored by the National concrete masonry association. By H. L. Whittemore, A. H. Stang and D. E. Parsons. Washington, U.S. Govt.print.off., 1939. 19p. U.S. National bureau of standards. Building materials and structures. Report BMS32.

Water Rights.

Water rights for irrigation in humid areas. By Wells A. Hutchins. Agricultural engineering. v.20,no.11. November, 1939. p.431-432,436.

Water Supply.

- Analysis of precipitation measurements on mountain watersheds. By H. G. Wilm and others. Monthly weather review. v.67,no.6. June, 1939. p.163-172. Purpose of study described was to ascertain, through analysis of precipitation measurements from gage systems upon mountainous watersheds, reliability of computed rainfall averages, and on basis of this analysis to decide what modifications of or additions to original gage distributions are necessary in order to obtain results accurate within preestablished limits.
- British Columbia's water resources. By E. Davis. Canadian engineer. v.76,no.24. June 13, 1939. p.11-12. Water rights branch of Provincial government estimates that possibilities exist for further developments totalling six to eight million horsepower--mountain ranges produce power opportunities ranging from low and medium to heads exceeding 2000 ft.
- Construction of farm ponds. By H. S. Swingle. Southern agriculturist. v.69,no.11. November, 1939. p.12.
- Engineering aspects of the influence of forests on mountain streams. By Richard A. Hertzler. Civil engineering. v.9,no.8. August, 1939. p.487-489. In progress at Appalachian Forest experiment station, near Asheville, N.C., is comprehensive investigation of influence of forests on mountain streams. Objectives and methods of these studies, and some results to date, are outlined. Of particular interest are descriptions of special stream-gaging devices, data on degree of stream control afforded by forest cover, and conclusions in regard to infiltration capacity of forest soils.
- Farm water supplies. By A. G. Carswell. Journal of the Ministry of agriculture. v.46,no.4. July, 1939. p.346-354.
- Ground water in the United States; summary of ground-water from wells and springs; methods of scientific investigation, and literature relating to the subject. By O. E. Meinzer. Washington, U.S. Govt. print.off., 1939. 232p. U.S. Geological survey. Water-supply paper 836-D.
- Ground water resources. By Kyle Engler and Deane G. Carter. Agricultural engineering. v.20,no.7. July, 1939. p.263-264,266. Summary: 1. 10-year study of ground water conditions in Grand Prairie of Arkansas has been conducted by University of Arkansas college of agriculture in cooperation with other agencies. 2. Irrigation water requirement during past 10 years amounted to approximately 20 acre-inches per year, on average of 124,000 acres of rice per year, 90 per cent of which was pumped from Pleistocene sands. 3. Withdrawal of water has resulted in lowering of ground water by average of 0.8 ft. per year; however, decline varies with seasonal rainfall, acreage, and location. 4. Continuous chart record affords evidence of gradual and persistent decline of ground water level, and shows annual, seasonal, and daily fluctuations. 5. It is evident that under present conditions safe yield of Pleistocene sands is being exceeded each

Water Supply. (Cont'd).

- year. Additional research study is under way to determine safe yield and possibility of developing economical surface supplies of irrigation water.
- Land and water in the high plains. By Homer M. Wells. Land policy review. v.11,no.1. January-February, 1939. p.20-24.
- Montana watersheds. By O. W. Monson. Montana farmer. v.26,no.18. May 15, 1939. p.13.
- Preserving the Central valley. By Walker R. Young. Civil engineering. v.9,no.9. September, 1939. p.543-546.
With completion of Central Valley project, water that has almost reached ocean via Sacramento River will be pumped hundred miles back upstream and turned into San Joaquin; artificial rivers will stretch in two directions from Friant Dam; reclaimed delta lands will be protected from salt water intrusion; and channels long choked with silt will again have adequate water depths for commercial navigation. Quick survey of project, with special emphasis on its present status.
- Relation of physiography to ground water supplies. In Forty-ninth annual report for the year ending June 30, 1938, Agricultural experiment station, University of Arizona. Tucson, Ariz., 1939. p.25-26.
- Relationship of stream flow to precipitation of the Salt river watershed above Roosevelt dam. By C. K. Cooperrider and G. G. Sykes. Tucson, Ariz., 1938. 69p. Mimeographed. University of Arizona. Technical bulletin no.76.
- Report of Sacramento-San Joaquin water supervision for year 1937. Sacramento, Cal., State print.off., 1938. 124p. Mimeographed.
- Report of Sacramento-San Joaquin water supervision for 1938. Sacramento, Cal., State print.off., 1939. 132p. Processed. State of California. Department of public works. Division of water resources.
- South coastal basin investigation: records of ground water levels at wells for the year 1938. Precipitation records for the season 1937-38. Sacramento, Cal., State print.off., 1939. 115p. Processed. State of California. Department of public works. Division of water resources. Bulletin no.39-G.
- Thirty-third annual report, 1937-38, Victoria State rivers and water supply commission. Melbourne, Australia, 1938. 95p.
- Water appropriation. By L. B. Stanton. California cultivator. v.86,no.10. May 20, 1939. p.301,303.
- Water appropriation. By L. B. Stanton. California cultivator. v.86,no.11. June 3, 1939. p.325.

Water Supply. (Cont'd).

Water levels and artesian pressure in observation wells in the United States in 1938. By O. E. Meinzer and L. K. Wenzel. Washington, U.S. Govt.print.off., 1939. 724p. Processed. U.S. Geological survey. Water-supply paper no.845.

Water, water, everywhere! By William H. Kircher. Farmer. v.57,no.10. May 20, 1939. p.5,11.

Water Supply, Rural.

Backflow prevention in over-rim water supplies. By G. E. Golden and R. B. Hunter. Washington, U.S. Govt.print.off., 1939. 17p. National bureau of standards. Building materials and structures. Report BMS28.

Increasing an inadequate farm water supply. By Forrest B. Wright. Farmers digest. v.2,no.6. October, 1938. p.12-15.

Cisterns or water softeners for the farm home? By A. G. Tyler. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter, no.93.

Running water. American agriculturist. v.136,no.18. September 2, 1939. p.3,17. Gives simple installation of automatic pump operated by electric motor, used in pumping water from shallow well where pump is not over 20 ft. above surface of water.

Running water for the farm and home. In Annual report of the Maine extension service for the year ending June 30, 1939. Orono, Me., 1939. p.13-14. University of Maine. College of agriculture. Extension bulletin no.267.

Rural water supply and sanitation. By F. B. Wright. New York, John Wiley & sons, inc., 1939. 288p. Book is written for those who wish to gain practical knowledge of water supply, sewage disposal, plumbing, and sanitation for rural homes and farms. Although book is designed with needs of school classroom in mind, subject matter should be equally useful to the rural home owner and farmer. Book includes instruction on more common jobs connected with water supply, sewage disposal, and sanitation, and supplements these jobs with a well-rounded discussion of the related subject matter. It has been the aim of author to present subject matter in such a way that one who masters contents of book should be able to take fullest advantage of possible water sources provided by nature, should be able to plan and construct safe, convenient, and sanitary sewage-disposal system, and should be able to service and keep in repair his plumbing and sewage-disposal systems at a minimum expense.

Book is divided into two parts. First part consists of series of practical jobs arranged more or less in order of difficulty, starting

Water Supply, Rural. (Cont'd).

with simpler ones. Second part consists of seven chapters of subject matter related to water supply, sewage disposal and sanitation.

Water service in the home. By O. S. H. Heinrich. South Australia.
Journal of agriculture. v.42,no.10. May, 1939. p.890-898.

Water systems in farm houses. Wallaces' farmer and Iowa homestead.
v.64,no.22. November 4, 1939. p.701. Add attic tank
to simple hot and cold hookup to provide pressure at faucets.

Water Works.

Operation and maintenance of water works distribution systems. By
W. A. Hardenbergh. Public works. v.70,no.6. June, 1939.
p.22-25,28-48. Water works operation cannot be learned from
books alone; nor solely from experience. Both are essential. To
provide a basic text, available to all water works operators, the
following material is presented in the hope that it will be a real
assistance to the men in the field. Primarily it is intended to
provide a foundation from which further education may be built up.

Water works and sewerage. 1939 edition, reference and data section.
Water works and sewerage. v.86,no.5. May, 1939. p.111-124.
Gives equivalent of handbook of data for designing engineers, managers
and operators of water works and sewerage systems.

Weeds.

Chemistry weeds the oats. By John B. Abbott. Farmer's digest.
v.3,no.2. June, 1939. p.24-27. Three methods of attack,
used in conjunction, are helpful in control program; namely, period
of clean cultivation before planting row crops, practice of harvesting
spring-sown small grains for hay or silage before mustard makes viable
seeds, and use of herbicides to kill young weeds in small grains with-
out injury to crop.

Chemistry weeds tobacco plant beds better for less money. By J. B. Abbott.
American fertilizer. v.91,no.3. August 5, 1939. p.13-14.

Cultivation kills bindweed. By Cordell Tindall. Missouri ruralist.
v.80,no.16. August 5, 1939. p.3,12.

Development of a weed consciousness. By G. H. Clarke. Journal of
the department of agriculture of South Australia. v.42,no.11.
June, 1939. p.950-952. There are two important aspects
of noxious weed problem, and these are equally deserving of attention
and development. There is research aspect which involves carrying
out of special investigational work along scientific lines. Owing
to considerations of cost scope of work is necessarily limited and
must needs be confined to weed pests of particular economic importance.
Second aspect is that of education. This should aim at raising general
level of scientific knowledge among farming community.

Weeds. (Cont'd).

- Eradication of bindweed in cities of Kansas. By T. F. Yost. Topeka, Kans., 1939. 15p. Kansas state board of agriculture. Report, August, 1939.
- Eradication of cornfield weeds. By H. C. Long. Journal of the Ministry of agriculture. v.46,no.1. April, 1939. p.51-53. Sulphuric acid spraying. Dusting with powdered cyanamide.
- Field bindweed, Missouri's worst weed pest. By George F. Jordan. Missouri farmer. v.31,no.17. September 1, 1939. p.3,5.
- Kittitas county weed program. By W. O. Passmore. Reclamation era. v.29,no.11. November, 1939. p.314-315. Weed-control program is based on theory that landowners and operators are entitled to protection from infestation coming from beyond their own property but that they are primarily responsible for control and eradication efforts on lands which they own or operate.
- Nebraska's program for weed control. By George S. Round. Reclamation era. v.29,no.9. September, 1939. p.239-240. Educational program; weed eradication districts; eradication; preventive measures.
- Noxious weeds. By R. C. Scott. Journal of the department of agriculture of South Australia. v.42,no.10. May, 1939. p.880-883.
- A pictorial showing the effects of delayed weed control upon subsequent growth of sugar cane. By R. J. Eorden. Hawaiian planters' record. First quarter, 1939. v.43,no.1. p.11-15.
- Prickly pear eradication and control. By W. H. Dameron, and H. P. Smith. College Station, Tex., 1939. 55p. Texas agricultural experiment station. Bulletin no.575.
- Recently enacted weed control legislation. By H. A. Hockley. Journal of land and public utility economics. v.15,no.1. February, 1939. p.99-101. During 1937 and 1938 only two completely new weed control laws were enacted--in Kansas and Washington. Other states merely added to existing lists of noxious weeds subject to control and eradication, or otherwise amended existing legislation so as to clarify or expand control procedures. Types of amendments enacted indicate increase of noxious weeds; they have been spreading rapidly on state, county, and federal, as well as privately owned, lands. Strengthening of control measures is designed to cope more effectively with this menace.
- Soil moisture relationship of European bindweed growing in corn. By A. L. Bakke. American society of agronomy. Journal. v.31,no.4. April, 1939. p.352-357. "Literature cited": p.357. Soil samples taken at depths of 1 and 2 feet from corn ground heavily infested with European bindweed and from ground free

Weeds. (Cont'd).

of weed during summer months of 1933, 1934, and 1935 did not show marked differences in soil moisture content. Bindweed was able to maintain itself when moisture content was below wilting coefficient. Deeply penetrating root system was in all probability responsible for action. Corn does not compete successfully with European bindweed when soil moisture content is near wilting coefficient. A 1-square-rod plat heavily infested with bindweed and planted to corn in 1933 and kept free of bindweed by weekly hoeing produced 33 pounds of corn while control plot received three cultivations and produced 16 pounds of corn.

Stop noxious weeds. Hoosier farmer. v.23,no.7. July, 1939. p.13. Sodium chlorate is recognized by Purdue agricultural experiment station as chemical best adapted for general use in killing noxious weeds in Indiana. Gives best results when used in solution.

We needed weed patrolmen. Wallaces' farmer and Iowa homestead. v.64,no.11. June 3, 1939. p.5,10. Systematic eradication program under the county commissioner plan gets results.

Weed control in oats. By J. B. Abbott. New England homestead. v.112,no.10. May 20, 1939. p.8-9. Plants of mustard family can be treated quite effectively by spraying or dusting.

Weeds in your grain drill. By Dolores E. Weimer. Farmer's digest. v.3,no.6. October, 1939. p.61-63. Table 1. Percentage of weed seeds found in samples examined in the seed testing laboratory.

Weirs.

Discharge of V-Notch weirs at low heads. By Fred W. Blaisdell. Civil engineering. v.9,no.8. August, 1939. p.495-496. Data presented indicate that dependable measurements cannot be made with V-notch weirs operating under low heads, unless they are carefully calibrated and conditions during use duplicate exactly conditions during calibration. Even then, large errors must be expected. In no case should weir be used at low heads unless it has been calibrated for such heads. Data presented here should not be used in calculating discharges from other weirs. They are presented only to give quantitative idea of errors that might be expected when a weir is used at low heads.

Welding.

Arc and gas welding developments. Engineering news-record. v.123,no.19. November 9, 1939. p.634-636. Weld design, inspection and technique are covered in addition to new developments in the use of oxyacetylene torch.

Atomic-hydrogen arc welding solves difficult problems. By W. E. Wilson. General electric review. v.42,no.10. October, 1939. p.427-431. Hydrogen atmosphere. Hard surfacing. Repairing

Welding. (Cont'd).

tools, dies, etc. Advantages of process. Applications. Materials that may be welded. Technique of welding by this process.

New developments in welding fittings. By E. Hall Taylor. Mechanical engineering. v.61,no.5. May, 1939. p.370-372.

Windmills.

Low velocity capacities are crux of wind electric plants. By M. L. Jacobs. Implement and tractor. v.54,no.9. April 29, 1939. p.12,28.

Windmills. By A. G. Tyler. Northwest farm equipment journal. v.53,no.6. June, 1939. p.27-28.

Windmills serve the farmer at low cost. By H. E. Klinefelter. Missouri farmer. v.31,no.20. October 15, 1939. p.3.

Wood.

Proper woods for farm repairs. Farmer's digest. v.3,no.6. October, 1939. p.27.

World wood pulp statistics, 1927-1937. New York, N.Y., United States pulp producers association, 1938. 148p. Processed.

Woodworking.

4-H woodworking project, unit 1. By J. B. Brooks and E. R. Young. Lexington, Ky., n.d. 23p. University of Kentucky. College of agriculture. Extension division. Circular no.325.

